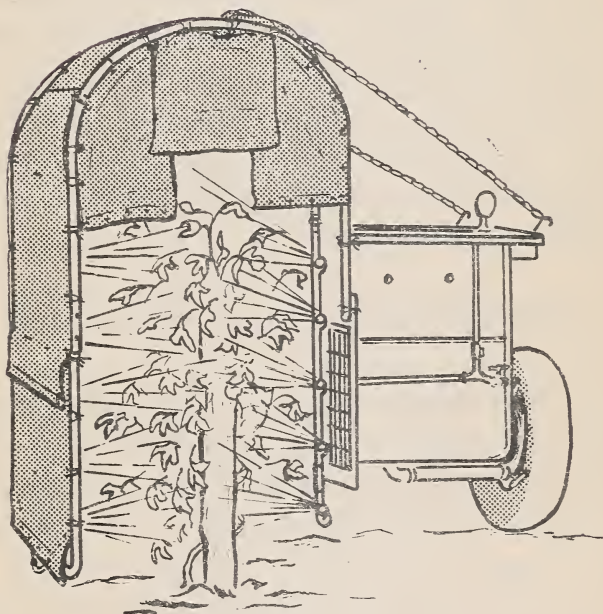


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HOODED-BOOM SPRAYER *for* GRAPES



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HOODED-BOOM SPRAYER FOR GRAPES

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A single-row hooded-boom-power sprayer is the most satisfactory equipment for spraying grapes in the East. A sprayer with a simple hood and dual booms, which can be constructed at home, is described herein. Certain features of construction and operation are essential; other features may be varied according to the desires of the individual grower.

Hood Framework and Covering

The framework for the hood (fig. 1) may be made of angle iron or of 1-inch galvanized-iron pipe, the horizontal supports of 3/4-inch pipe. The top may be flat or arched. A framework of iron pipe and an arched top are favored. The pipe for the arched top can be bent over the rim of a steel wheel, such as the rear wheel of an old tractor, with lugs removed. The horizontal pipes connecting the front and rear arches may be joined by welding, or by means of pipe tees (fig. 2) or special pipe clamps. If pipe tees are used they can be reamed to slide easily and can be held in place by a set screw. Threading will weaken the pipe.

The framework should be high enough to clear all posts, usually about 7 feet, not over 44 inches wide across the arch, and 3 or 4 feet long. Longer hoods are more difficult to handle and shorter ones allow more spray to escape. If occasional grape posts are

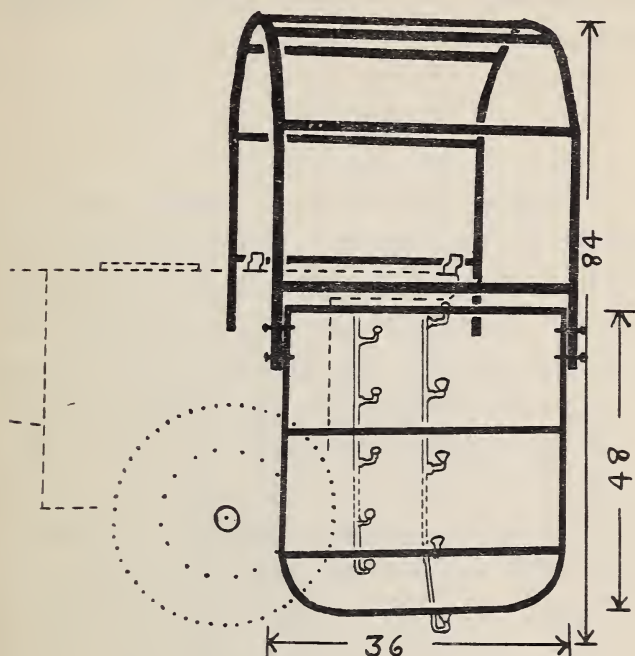
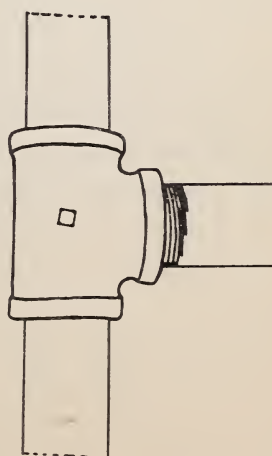


Figure 1.--Framework of hood, showing boom and nozzles.

Figure 2.--Sliding connection for hood framework.



extremely high, they should be shortened.

A tilting hood (fig. 3) has the advantage over a fixed one of easier storage and maneuverability when mounted on the sprayer. It can be tilted over

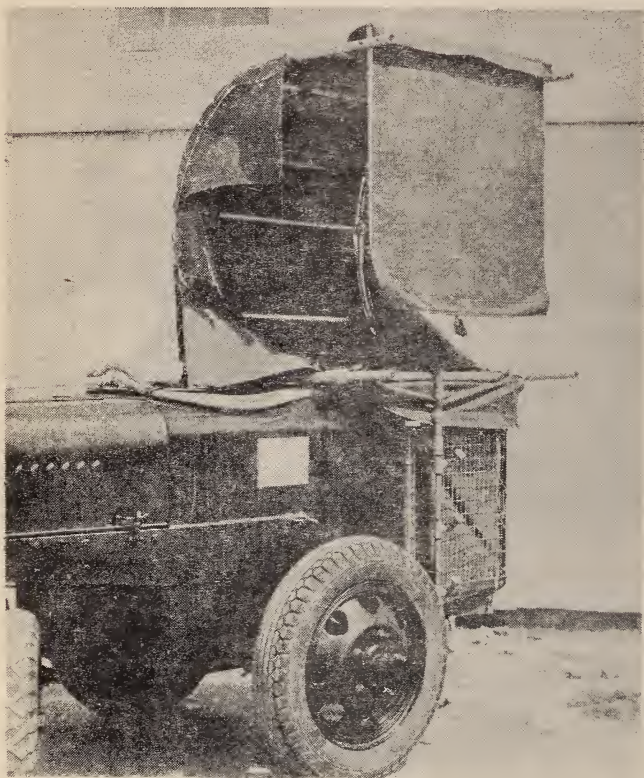


Figure 3.- Hood tilted over the sprayer.

the sprayer to permit the treatment of grape rows having high posts, trees, or other tall objects. The outside hinged section which hangs down from the arched section may be merely a canvas flap, but preferably should be supported by a framework of 1/2-inch galvanized-iron pipe (fig. 1). The hinge arrangement can be made by using iron pins in holes drilled into the main framework on each side of the flap.

If the vineyard rows are narrow, the side of the spray tank can serve as the lower inside portion of the hood, but if they are wide a canvas or sheet-metal guard may be fixed to this portion of the hood.

The framework may be covered with sheet metal, canvas, a heavy grade of waterproof sisal paper, or other similar material. If canvas, other cloth, or paper is used, the frame should be covered first with a netting of chicken wire or welded wire to support the cloth or paper and prevent it from sagging or tearing readily. The end coverings of the hood may be made of two or more strips of old canvas or other flexible material (fig. 4). The end cover flaps usually have to be replaced often.



Figure 4.--Rear of hood, showing end flaps of canvas.

Mounting the Hood on the Sprayer

The hood is usually mounted on the sprayer by means of cross arms, or brackets, which extend across the top of sprayers that have wooden tanks; on steel tanks the brackets may be welded directly to the tanks. It should

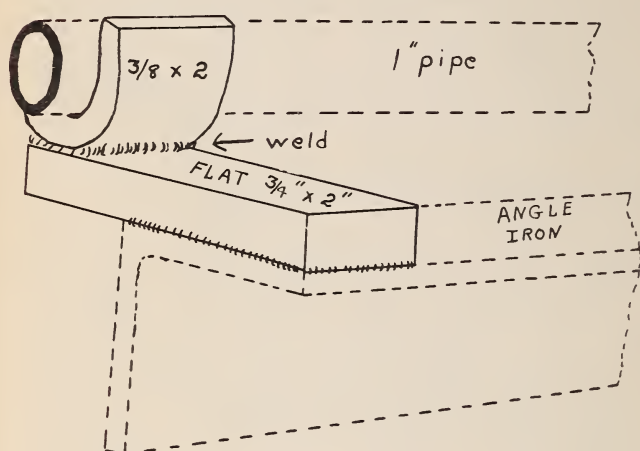


Figure 5.--U-shaped mount for supporting horizontal bar of hood for tilting.

be easily removable if the sprayer is to be used for spraying crops other than grapes, and should be mounted or supported in such a way that it can be tilted to avoid striking objects such as posts or tree limbs. The hood can be set up to tilt by placing one of the horizontal pipes of the frame into two U-shaped iron mounts (fig. 5) at the ends of the two cross arms or brackets extending across the top of the sprayer tank.

If the framework of the hood is solidly connected with the horizontal supporting pipe in the U-shaped mounts by welding, the supporting pipe must be at the proper height to provide the desired height of the hood. If the hood is attached to the framework with sliding clamps or tees at each end (fig. 2), this is not important, since it can then be raised or lowered as desired.

The mounted hood is partially supported by chains (fig. 4) extending from the top of the arch to the opposite side of the spray tank, one chain from the front and one from the rear arch.

Boom and Nozzle Arrangement

The two booms are located inside the spray hood, about midway along each side. Booms placed at the corners of the hood are not satisfactory unless one is placed at each corner. Each boom is made up of a series of pipe fittings and long pipe nipples. A tee fitting, either $3/4$ or $1/2$ inch, attached just above the top nozzle on the inside boom takes the spray discharge from the pump connection. The spray is carried through a hose from one opening in this tee across the top of the hood, inside, to the outer boom, and from the other opening to the boom on the inner side of the hood.

The booms should be of sufficient length to provide for a top nozzle about 6 inches below the top trellis wire, a bottom nozzle 6 inches above the ground, and at least 3 regularly spaced intervening nozzles about 8 to 10 inches

apart (fig.6). A total of 10 nozzles, 5 on each boom, is about the minimum number for effective spray coverage.

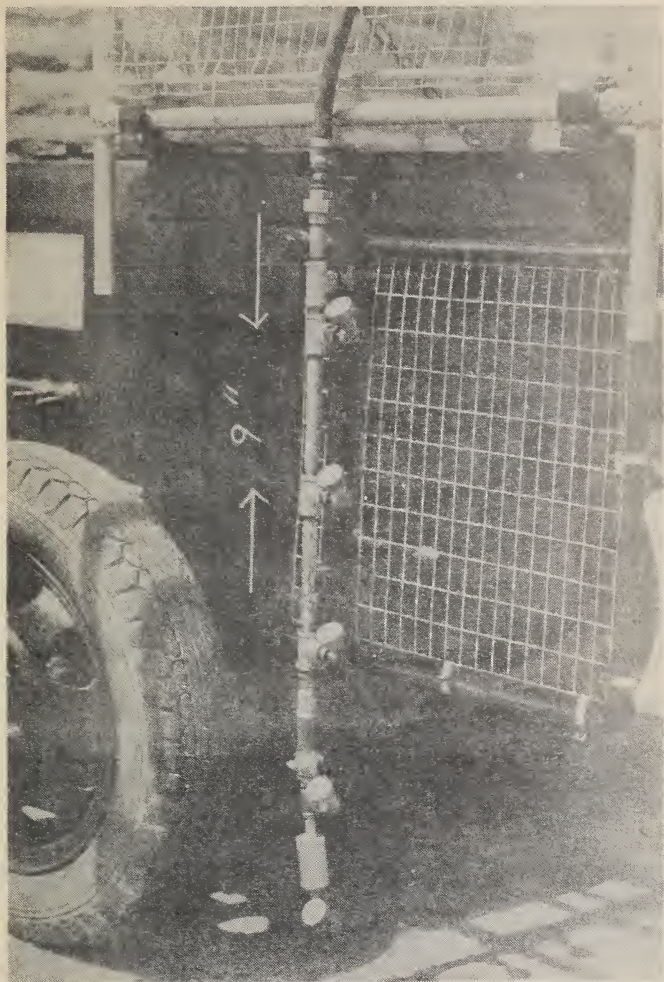


Figure 6. --Nozzles on boom, showing angle of nozzles and spray hose connecting two lower nozzles with upper portion of boom.

The nozzles are attached to the lateral openings of $\frac{1}{2}$ -inch tees by means of a bushing and a $\frac{1}{4}$ -inch street ell. Pipe nipples $\frac{1}{2}$ -inch by about 7 inches are used to connect the tee fittings between the three upper nozzles, $\frac{1}{2}$ -inch spray hose about 7 inches long is used to connect the third and fourth nozzle

fittings, and a pipe nipple $1/4$ inch by 7 inches to connect the fourth and fifth, or two lowest, nozzles. Use of the spray hose for one of the lower connections permits free movement when struck. A lead weight between the two lower nozzles prevents pressure from thrusting the bottom nozzles backward.

The booms can be fastened to the hood, or side of the sprayer, with U-bolts or by other suitable means. Only the top three nozzles are fastened to the hood rigidly; the two lower nozzles are left to swing free on the hose connection. If the hood is of the tilting type, the outer boom should be fastened to it low enough to allow the boom to hang vertically when the hood is tilted back over the sprayer.

Nozzles should be of sufficient size to give adequate spray coverage and pressure strong enough to lift the grape leaves. Openings of $3/64$ inch in the nozzle disks are satisfactory.

For most effective coverage the angle of the nozzles should be adjusted before each application. The adjusting can be done best by some one following the sprayer for a row or two while it is in operation. The proper adjustments cannot be determined by an operator on a tractor or on the top of the sprayer. The nozzles may be directed upward or horizontally, depending on the season of the year, but they should never be directed downward. The horizontal position or a low upward angle is best suited to applications of prebloom sprays when there is but little foliage on the vines. After the

grapes bloom, an upward angle of about 45 degrees is generally most satisfactory, the lower nozzles being set at a slightly greater upward angle than the upper ones. In July and August, when sprays are directed primarily at the clusters, the two upper nozzles can be plugged and drive nozzles substituted for the three lower regular ones.

Operation

A hooded-boom sprayer can be operated easily by one person if a quick-action shut-off valve accessible to the operator is provided (fig. 3). Such a valve can be installed on a hose or pipe leading from the spray pump.

With a boom of the type described a sprayer with a pump capacity of 15 gallons or more per minute must be used. To apply the required quantity of spray per acre--200 gallons before bloom and 250 or 300 gallons later especially in July and August when foliage is heavy--the sprayer should be pulled through the grape rows at a speed of about 2 to 2 1/2 miles per hour (176 to 220 feet per minute). The lighter applications should be made by using disks with smaller openings in the nozzles rather than by increasing the speed of the sprayer.

